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28441 7590 05/07/2009

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SALT LAKE CITY, UT 84111-3400

EXAMINER

LAU, JONATHAN S

ART UNIT

PAPER NUMBER

1623

DATE MAILED: 05/07/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,106

10/09/2006

Morris J. Robins

49506-7

1963

TITLE OF INVENTION: METHOD FOR THE PREPARATION OF 2-HALO-2'-DEOXYADENOSINE COMPOUNDS FROM 2'-DEOXYGUANOSINE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	08/07/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

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B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

28441 7590 05/07/2009

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/529,106 10/09/2006 Morris J. Robins 49506-7 1963

TITLE OF INVENTION: METHOD FOR THE PREPARATION OF 2-HALO-2'-DEOXYADENOSINE COMPOUNDS FROM 2'-DEOXYGUANOSINE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	08/07/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
LAU, JONATHAN S	1623	536-027700

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,106	10/09/2006	Morris J. Robins	49506-7	1963
28441	7590	05/07/2009	EXAMINER	
BRINKS HOFER GILSON & LIONE/UTAH UTAH OFFICE 405 South Main Street Suite 800 SALT LAKE CITY, UT 84111-3400			LAU, JONATHAN S	
			ART UNIT	PAPER NUMBER
			1623	
			DATE MAILED: 05/07/2009	

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/529,106	ROBINS ET AL.	
	Examiner	Art Unit	
	Jonathan S. Lau	1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Applicant's Amendment and Remarks, filed 28 Jan 2009.
2. ☒ The allowed claim(s) is/are 25-36.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date ____. 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other ____. |
|--|---|

/Shaojia Anna Jiang/
Supervisory Patent Examiner, Art Unit 1623

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ryan L. Marshall on 24 April 2009.

The application has been amended as follows:

Claims 8, 10, 12, 14, 16 and 18-24 are canceled.

Claim 27 is amended at lines 7-9 to delete a space indicated by the "[[]]" and insert the hyphens:

"of (alkyl or fluoroalkyl or cycloalkyl)[[]]-sulfonyl, -phosphoryl or -phosphonyl groups, (aryl or 4-methylbenzene or 2,4,6-triisopropylbenzene)-sulfonyl, -phosphoryl or -phosphonyl groups;"

Claim 29 is amended at lines 7-10 to insert the hyphens:

"cycloalkyl)-sulfonyl, -phosphoryl or -phosphonyl reagents and (aryl or 4-methylbenzene or 2,4,6-triisopropylbenzene)-sulfonyl, -phosphoryl or -phosphonyl reagents to produce a 6-O-(alkyl, substituted alkyl, cycloalkyl, aryl, or substituted aryl)-sulfonyl, -phosphoryl or -phosphonyl group that is capable of hindering".

Claim 31 is amended at line 7 to add the text:

“chlorides, metal chloride salts, acyl chlorides, sulfonyl chlorides,
phosphoryl chlorides, silyl chlorides,”.

Claim 35 is amended to change the status of the claim:

“35. ~~(Previously presented)~~(New)”.

Claim 35 is amended at lines 6-9 to delete spaces indicated by the "[]" (see below) and insert the hyphens:

“silyl, with an (alkyl or fluoroalkyl or cycloalkyl)[]-sulfonyl or -phosphoryl reagent or (aryl or 4-methylbenzene or 2,4,6-triisopropylbenzene)[]-sulfonyl or -phosphoryl reagent to convert the 6-oxo group to a 6-O-(alkyl, cycloalkyl, or aryl)[]-sulfonyl or -phosphoryl group;”.

DETAILED ACTION

This Office Action is responsive to Applicant's Amendment and Remarks, filed 28 Jan 2009, in which claims 23 and 24 are amended to correct minor informalities and new claims 25-36 are added.

This application is the national stage entry of PCT/US03/30386, filed 25 Sept 2003, and claims benefit of US Provisional Application 60/413,915, filed 25 Sept 2002, and US Provisional Application 60/416,329, filed 04 Oct 2002.

Claims 25-36 are pending.

Rejections Withdrawn

Applicant's Remarks, filed 28 Jan 2009, with respect to claims 8, 10, 12, 14, 16 and 18 rejected under 35 U.S.C. 112, first paragraph as not being enabling for the full scope has been fully considered and is persuasive, as Applicant's Remarks are persuasive that the experimentation involved in determining the temperature less than 0°C in which the invention is enabled, in view of the working example provided in the specification and the level of skill of the art, would not constitute an undue and unpredictable experimental burden, and claims 8, 10, 12, 14, 16 and 18 are canceled by Examiner's Amendment herein.

This rejection has been **withdrawn**.

Examiner's Amendment, detailed herein, with respect to claims 19-24 rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification has been fully considered and is persuasive, as claims 19-24 are canceled.

This rejection has been **withdrawn**.

Statement of Reasons of Allowance

Claims 25-36 are found allowable.

The following is a statement of reasons for the indication of allowable subject matter:

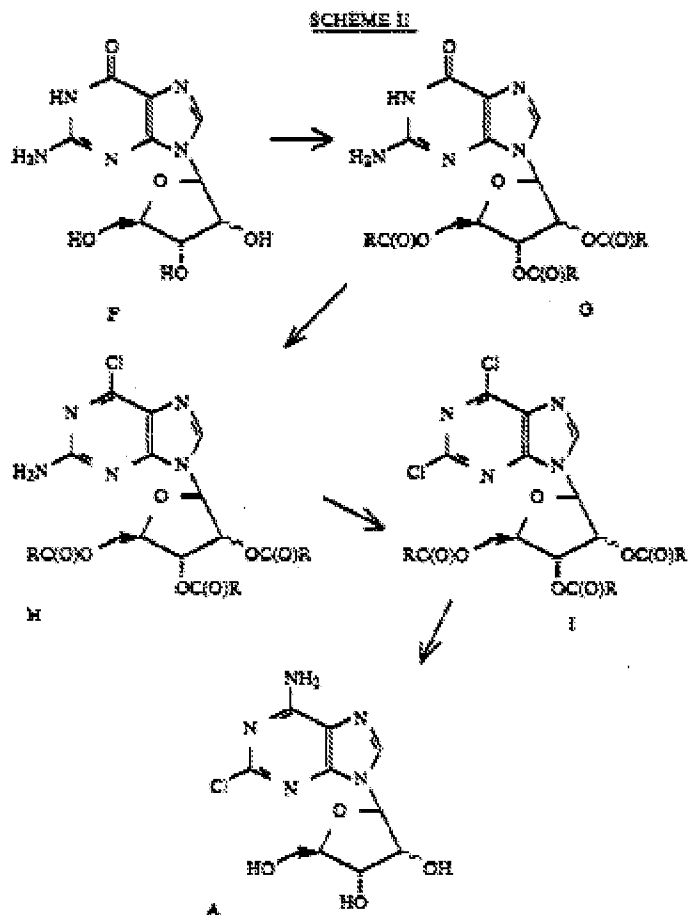
Art Unit: 1623

The closest prior art is Chen (US Patent 5,208,327, of record) and Bauman et al. (US Patent 5,668,270, of record).

Chen discloses the reaction of guanosine wherein the hydroxyl groups of the sugar are protected with acetyl groups (see chemical structure column 2, lines 1-13) to give 2-chloroadenosine comprising the steps of reacting the 6-oxo group with an inorganic acid chloride to give the 6-chloro compound, replacing the 2-amino group with a 2-chloro group by a diazotization/chloro-dediazotization reaction using a nitrosylating agent such as an alkyl nitrite and a chloride source such as an alkyl chloride, and replacing the 6-chloro group with a 6-amino group and removing the R protecting

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groups as per scheme II (column 6 lines 5-42):



See Chen, column 6 lines 56-58, 61-64, and 67. Chen discloses the conversion of the 2-chloroadenosine to the 2-chloro-2'-deoxyadenosine after conversion of the guanine moiety to a 2-chloroadenine moiety. The 6-oxo group is converted to a 6-chloro group, which is a leaving group that less reactivity than the 2-amino group in a diazotization/chloro-dediazotization reaction as evidenced by the fact the 6-chloro group remains after the diazotization/chloro-dediazotization reaction without requiring any protecting group to reduce its reactivity.

Bauman et al. teaches the conversion of the 6-oxo group of guanosine to a 6-amino group with an intermediate reaction of the 6-oxo group of guanosine with a 6-O-sulfonyl leaving group, where the sulfonyl group is an alkyl or aryl sulfonyl group, in the place of the 6-halo group. See Bauman et al. column 3, lines 36-49.

Neither Chen nor Bauman et al. specifically disclose or teach the method wherein replacing the 2-amino group with a 2-chloro group is performed using acetyl chloride and benzyltriethylammonium nitrite. It would not have been obvious to one of ordinary skill in the art to substitute a nitrosylating agent such as an alkyl nitrite and a chloride source such as an alkyl chloride taught by Chen with acetyl chloride and benzyltriethylammonium nitrite. This deficiency is not remedied by the teaching of Bauman et al.

With regard to new claims 26, 28, 30, 32, 34 and 36, Applicant's Remarks are persuasive that the experimentation involved in determining the temperature less than 0°C in which the invention is enabled, in view of the working example provided in the specification and the level of skill of the art, would not constitute an undue and unpredictable experimental burden. Therefore new claims 26, 28, 30, 32, 34 and 36 are not rejected under 35 U.S.C. 112, first paragraph as not being enabling for the full scope.

Claims 25-36 have utility as a method for producing 2-chloro-2'-deoxyadenosine, or cladribine, a drug with a well known utility.

The specification at pages 12-16 provide sufficient working examples of the synthesis such that one of skill in the art is enabled to practice the invention of claims 25-36.

Conclusion

Applicant's Amendment and Remarks, filed 28 Jan 2009, and the Examiner's Amendment, detailed herein, are sufficient to remove all rejections made in the prior Office Action and place the application in condition for allowance. Therefore claims 25-36 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan S. Lau whose telephone number is 571-270-3531. The examiner can normally be reached on Monday - Thursday, 9 am - 4 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on 571-272-0627. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jonathan Lau
Patent Examiner
Art Unit 1623

/Shaojia Anna Jiang/
Supervisory Patent Examiner
Art Unit 1623